

CLAIMS LISTING -CLEAN COPY

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1. A biomechanically correct pedal powered paddling system for small watercrafts comprising:

- a. a watercraft attaching frame having:
 - i. a central width-adjustable joining portion,
 - ii. two opposing watercraft-clamping members for attaching said frame to watercraft gunwale,
 - iii. two opposing pedal-assembly receiving portions,
 - iv. two opposing primary linkage pivoting collapsible members,
 - v. a diagonal support member forming a rigid, generally-triangular structure,
 - vi. frame extension extending perpendicularly from each end portion of said frame,
 - vii. two opposing secondary linkage folding members, and
 - viii. a plurality of pivotal axle members,
- b. a pedal drive assembly having:
 - i. a primary pedal drive shaft having extension receiving female members at each end,
 - ii. two drive shaft extensions having non-rotatable male ends longitudinally adjustably mating with female drive shaft members and paddle drive members distal from the primary drive shaft, and

- iii. two foot pedals rotably attached to offset member integral with a pedal drive shaft forming the crank member,
 - c. an upper and lower paddle-attaching portion each having:
 - i. a paddle receiving portion,
 - ii. a linkage attaching portion having single axis rotational freedom from paddle receiving portion, and
 - iii. releasable paddle locking member,
 - d. a linkage array having:
 - i. a paddle crank arm having a non-rotational female end adapted to receive the male end of the drive shaft extensions, and a rotational end adapted to secure to the linkage attaching portion of the above paddle receiving portion,
 - ii. a swing lever,
 - iii. a vertical member, and
 - iv. a plurality of pivotal axle members,
 - e. the paddling system thus allows simulation of the biomechanical motion of conventional arm powered paddling by mechanically duplicating the ideal geometry and moments generated by the human act of paddling a canoe-like watercraft.
2. The biomechanically correct pedal powered paddling system of claim 1 wherein the pedal drive assembly comprises a drive extension at each end thereof having a longitudinally slidable non-rotational joint therebetween.
3. The biomechanically correct pedal powered paddling system of claim 1 wherein the paddle crank arm is rotably driven by force generated by rotational motion of the pedal drive assembly.

4. The biomechanically correct pedal powered paddling system of claim 1 wherein upper and lower paddle clamps are adapted with a quick-release apparatus for easy removal of said paddles.

5. The biomechanically correct pedal powered paddling system of claim 1 wherein simulation of the biomechanical motion of conventional arm powered paddling is achieved by a compound motion generated by a dual axis-dual pivot further comprising a lower paddle-connecting point pivotally attached to an extremity of a rotating crank arm, and an upper paddle-connecting point pivotally attached to the extremity of a swing lever.

6. The biomechanically correct pedal powered paddling system of claim 6 wherein the lower-mid section of a paddle follows a circular orbit about a center point of the drive crank arm, and the upper section of the paddle follows a semi-circular arc about a center point of the swing lever where said arc center point is located generally above the drive crank arm center.

7. The biomechanically correct pedal powered paddling system of either claim 1, 2, 3, 4, 6, or 7 wherein use thereof is for propelling a small watercraft using one's leg power while simulating the biomechanical motion of conventional arm powered paddling.

8. The biomechanically correct pedal powered paddling system of either claim 1, 2, 3, 4, 6 or 7 wherein a user can quickly disable the system by disconnecting the paddles from each rotating crank arm swing lever, disengaging the diagonal support member at one end, and folding down the vertical members against the upper portion of the watercraft attaching frame assemblies.